

IN THE CLAIMS

1. -- 10. (canceled)

11. (new) A foldable wheelchair comprising:

a foldable X-shaped chair frame having a seat onto the X-shaped chair frame;

a pair of auxiliary power units, having motor (801) and decelerator (802) driven by auxiliary power source, mounted at a rear portion of the foldable x-shaped chair frame sections by fastening means;

a pair of drive wheels (701), having cylindrical hollow drive wheel hubs (203) with a plurality of guide grooves at a inside periphery, mounted rotationally about a rotational drive shaft driven by the auxiliary power unit, wherein the drive wheel hub coupled with the drive shaft by clutch means allowing the drive wheel to be driven selectively by manual force of a driver on the seat or by auxiliary power;

a pair of wheel hub ratchet clutch devices, mounted rotationally about a rotational drive shaft driven by the auxiliary power unit and coupled in a periphery of the drive wheel hub, allowing the auxiliary power units to be selectively engaged/ disengaged with the drive wheels and wheel means driven by the drive wheel, further comprising;

a drive wheel shaft (208), having a ratchet gear (203) on outer periphery, coupled with a bore of the decelerator (802) of the auxiliary power unit;

a drive sprocket wheel (140), having sprockets on a periphery portion and a ratchet gear (211) on a outer periphery of a hollowed boss, mounted rotationally about the drive wheel shaft (208);

a cam cylinder block (215), having a plurality of guide grooves formed axially in a outer surface, and having a through hole at a central portion of the block and a couple of holes communicated with the through hole, supports the drive wheel shaft and the drive sprocket wheel rotatably;

a plurality of ratchet arms (217) pivoted on the cam cylinder block and a plurality of elastic springs (218);

a plurality of cam shafts (221, 222), having a cylindrical surface and a planar portion on peripheral surface and a couple of elastic springs (224), mounted through the holes of the cam cylinder block, wherein the cam shafts are movable in axial direction by a pushing force transmitted from a cable-hauling ratchet (250) so that the cylindrical surface or the planar portion of the cam shaft contact on the ratchet arm (217), enabling to engage/disengage the ratchet arms to the ratchet gears of the drive wheel shaft and the drive sprocket wheel, so as to selectively connect/disconnect the auxiliary power to the cam cylinder block and the drive sprocket wheel, and so a driver seated on the seat enables manual drive by himself after driving in auxiliary power driving mode selectively by push/pull the cable-hauling ratchet;

a pair of caterpillars mounted on a front section of the foldable chair frame, driven by the rotating force from the drive wheel at the same speed of the drive wheels against the ground, so that all the wheels of the wheel chair are rotated forcedly which enabling to increase inclining ability over obstacles or depressions on a road, further comprising;

a plurality of cylindrical wheels (146,147,148), having at least a groove on a periphery of the cylindrical wheel and a rotary shaft in the central portion of the cylindrical wheel, mounted on a front section of the foldable chair frame by fastening means;

a plurality of flexible belts (149) wound around a plurality of the cylindrical wheels along the grooves, of which linear sections between adjacent the wheels define at least a triangle with an approach angle in forward direction and;

a pair of sprocket wheels, mounted at a rear most the cylindrical wheel (146) of the caterpillars concentrically to the rotary shaft, is being driven by a plurality of flexible chains (141,144) transmitted from the drive sprocket wheel, and enables the caterpillars;

a pair of foldable auxiliary x frames, mounted on the chair frame allowing to support a caster wheel at an symmetric center of the foldable chair frame, further comprising;

a pair of a rod members (123,124) of an equal length hinged rotationally at a middle portion (135) forming X-configuration, of which upper ends are mounted on a upper portion of the chair frames (101,102) through hinge means so as to be foldable along with the chair frame;

a pair of a rod members (126,127) of an equal length coupled with each ends (136) rotationally by hinge means, of which opposite side ends are mounted rotationally on a portion of the rod members of X-configuration, forming symmetric four-lever-linkage which defines a couple of hinge(135,136) vertically arranged against the ground surface at the symmetric center of the foldable chair frame so as to be able to support a member joined with the couple of hinges vertically to the ground surface;

a lifting caster wheel, mounted on the auxiliary x-frame, enabling to lift up/down the chair frame and the caterpillars are lifted up/down so as to allowing the wheel chair to be driven by three wheels permitting easy steering operation or to climb up obstacles on a road, further comprising;

a caster wheel with a steering shaft member (405) mounted to be rotated and slide along the axis of the steering shaft through a hole of hollow cylinder (407), wherein the hollow cylinder is mounted on the hinges (135,136) of the symmetric four-lever-linkage through hinge means in a symmetric middle portion between the left/right foldable chair frame sections perpendicularly against ground surface;

a fixed shaft member (409) extended from a outer surface portion of the hollow cylinder (407) vertically to the axis of the hollow cylinder which is coupled rotationally on the one hinge (135) of the four-lever-linkage of the auxiliary x-frame;

a sliding shaft member (408) placed in a guide hole (413) of the hollow cylinder along the axis, having a shaft member (410) vertically to the axis of the hollow cylinder, wherein the shaft member (410) mounted rotationally on the one hinge (136) of the symmetric four-lever-linkage so as to the hollow cylinder support the caster wheel on the auxiliary x-frame perpendicularly against ground; and

a spring member (414) placed between the steering shaft member (405) and the hollow cylinder, pushing down the caster wheel against the hollow cylinder, so that the chair frame and the caterpillars are lifted up so as to enable the wheel chair is driven by three wheels permitting easy steering operation;

a cable-hauling ratchet, having a pull/push handle (250) and stop /releasing ratchet device (253,254,256) mounted on the chair frame section, which enable to pull/push a cable linked to operate the cam shaft of the ratchet clutch device and the cable linked to the steering shaft member (405) by pulling/pushing the handle, so as to lift up the caster wheel to operate the caterpillars and the drive wheels.

12. (new) A foldable wheelchair comprising:

a foldable X-shaped chair frame for having a seat on the X-shaped chair frame;

a pair of auxiliary power units respectively having motors and decelerators at opposite rear portions of the foldable X-shaped chair frame;

a pair of drive wheels respectively having cylindrical hollow drive wheel hubs on the opposite rear portions of the foldable X-shaped chair frame;

a pair of wheel hub ratchet clutch devices respectively in the hollow drive wheel hubs for selectively engaging/disengaging the auxiliary power units with the drive wheel hubs and, thereby, the drive wheels;

a pair of caterpillars respectively on opposite front portions of the foldable X-shaped chair frame;

means for driving the caterpillars with the drive wheel hubs when the wheel hub ratchet clutch devices selectively engage the auxiliary power units with the drive wheel hubs, whereby to drive the foldable X-shaped chair frame with the drive wheels and caterpillars;

a caster wheel at a symmetric center of the front portion of the foldable X-shaped chair frame; and

means for lowering the caster wheel from a position above the caterpillars to a position below the caterpillars, whereby to raise the caterpillars from the drive thereof.

13. (new) The foldable wheel chair according to claim 12, wherein:

the drive wheel shaft (208) has the ratchet gear (203) on an outer peripheral portion (208), of which one end is coupled with the decelerator (802) and an opposite end, which has an axial slot hole (206), is coupled rotatably with the hub of the drive wheel;

the plurality of the ratchet arms (217) are formed from a plate member of a thickness having a round rod at a side portion;

the drive sprocket wheel has the sprocket wheel (140) and the ratchet gear (211) at a peripheral portion of the hollow boss, wherein a shaft portion of the shaft ratchet gear (203) coupled with the hollow boss of the drive sprocket wheel being aligned coaxially and rotationally each other;

the cam cylinder block (215) has a plurality of guide groove formed axially in the outer surface, and having a through hole at central portion, and a couple of holes communicated with the through hole, coupled with the drive sprocket wheel (210) and the drive wheel shaft trough the hole in central portion coaxially, mounted rotatably on the drive wheel shaft, and coupled with the drive wheel hub (203) detachably through guide grooves on outer surface of the cam cylinder block;

the plurality of the cam shafts have a cylindrical surface and a planar portion on peripheral surface and a couple of elastic springs (224), mounted through the holes of the cam cylinder block, wherein the cam shafts are movable in axial direction by a force transmitted from the cable-hauling ratchet (250) so that the cylindrical surface or a planar portion of the cam shaft contact on the ratchet arm (217), enabling to engage/disengage on the gear (211) of the drive sprocket wheel (140) selectively which enables idling the caterpillar during manual drive of the drive wheel, and wherein the cam shaft (222) engages/disengages the ratchet arm to the gears (203) of the drive wheel shaft according to contact the cylindrical surface or the planar portion of the cam shaft so that the cam cylinder block and the drive wheel is rotated selectively in bi-directional by auxiliary power or is rotated in idle by manual force, and is locked to prevent backward rolling, and so that a driver seated on the seat enables manual drive by himself after

driving in the auxiliary power driving mode selectively by pushing/pulling the cable-hauling ratchet; and further comprising:

a cam holder disk (225), having a hollow at central portion of a disk member wherein the cam holder disk coupled perpendicularly with the cam shafts, mounted on the cam cylinder block sliding axially along the cam shaft; and

a traction cable holder (202) with a traction cable at an end, having a cylindrical pin (207) perpendicularly extended through a perforated hole(206) of the drive wheel shaft (208), mounted through the hole at axial center of the drive wheel shaft (208) to be pulled back so as to push the cam holder disk (225) rotationally through a bearing plate (235) and a rolling bearing (234) and the cam holder disk and the cam shaft, and when the traction cable is released, the cam shaft is moved reversely by the elastic spring (224).